Message

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Subject: STICS: Clearance Completion: #ORD-010121: Carcinogenic Risk from Dermal Exposure to Benzo[a]Pyrene

The clearance for this Human Health Risk Assessment product is complete:

- **Product type, subtype:** Presentations and Technical Summaries, Abstract
- **Product title:** Carcinogenic Risk from Dermal Exposure to Benzo[a]Pyrene
- **Author(s):** Newhouse , K,K. Hogan ,L. Phillips ,J. Strong and V. Cogliano
- **Initiator:** Crystal Samuels,ord/ncea/odd
- **ORD Tracking Number:** Tracking # ORD-010121
- **Product Description / Abstract:** Benzo[a]pyrene (BaP) is a polycyclic aromatic hydrocarbon (PAH) with mutagenic and carcinogenic properties that is found in the environment primarily as a result of incomplete burning of materials that contain carbon. High soil concentrations are found at hazardous waste sites associated with creosote/wood treatment, coal gasification, and petrochemical industries. Thus, the general population can be exposed to BaP dermally via contact with soil and sediment contaminated with PAHs. Occupational exposure to complex mixtures of PAHs, including BaP, such as coal tar, coal tar pitches, unrefined mineral oils, shale oils, and soot has been demonstrated to be associated with increased risk of skin cancer in humans. Previous EPA efforts to characterize the risk from BaP exposure via contaminated soil have focused on systemic absorption and did not address direct effects on the skin. As dose-response data demonstrating increased incidence of benign and malignant skin tumors in mice following repeated dermal exposure to BaP are available, EPA's Integrated Risk Information System has developed a draft cancer slope factor for dermal BaP exposure to estimate increased risk of skin cancer. Male mouse incidence data from a well reported, lifetime, low dose bioassay were modeled using the multistage-Weibull model. As no established methodology exists to adjust for interspecies differences in dermal toxicity at the point of contact, several methods were explored to extrapolate from mice to humans. Ultimately, the BMDL10 for the occurrence of skin tumors in mice exposed dermally to BaP was adjusted to a human equivalent POD by allometric scaling, in order to account for more rapid metabolism, distribution, and clearance in mice. As evidence supports a mutagenic mode of action, linear low-dose extrapolation is recommended, using the proposed dermal slope factor of 0.006 per ug/day. The views expressed in this abstract are those of the authors and do not necessarily reflect the views or policies of the U.S. EPA.
- **Tracking and Planning**
  - Task ID: HHRA121
  - Task: Technical Workgroups in Support of IRIS Toxicological Reviews
  - Product Title: N/A - Not Applicable
  - Product Description: N/A - Not Applicable
  - Project: Human Health Risk Assessment Support

- Topic: N/A - Not Applicable
- Research Program Area: Human Health Risk Assessment

- **HISA? ISI? High Profile?:** Not Applicable
- **QA form attached in STICS?:** No
- **QAPP Reference:** N/A
- **Keywords:**
  - IRIS
  - human health
  - benzo[a]pyrene
  - PAH

- **Meeting Information:**
  - Meeting Name: Society of Toxicology
  - Meeting Start Date: 03/22/2015
  - Meeting End Date: 03/26/2015
- **DOI:** http://dx.doi.org/

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